APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/392,124	09/08/1999	DOUGLAS A. CHRISSAN	8X8S.239PA	9597

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EXAMINER
AZAD, ABUL K

ART UNIT	PAPER NUMBER
2654	

DATE MAILED: 01/30/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

		Application No.		Applicant(s)	
Office Action Summary		09/392,124		CHRISSAN ET AL.	
		Examiner		**Art Unit**	
		ABUL K. AZAD		2654	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on _08 September 1999_ .

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) _1-32_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) _1-32_ is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)   4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)   5) ☐ Notice of Informal Patent Application (PTO-152)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _6_ .   6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 112

1.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2.   Claim 28 is rejected under 35 U.S.C. 112, first paragraph, as containing subject

matter which was not described in the specification in such a way as to enable one

skilled in the art to which it pertains, or with which it is most nearly connected, to make

and/or use the invention. As per claim 28, the specification does not describe a

exponential function, or how that exponential function modifies the pulse-train function.

Claim Rejections - 35 USC § 102

3.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4.   Claims 1-27 and 29-32 are rejected under 35 U.S.C. 102(b) as being anticipated

by Bialik et al. (US 5,568,588).

As per claim 1, Bialik teaches, "in a speech processing system including a signal

processor arrangement that analyzes an input speech signal and, in response,

generates the short-term characteristics of the input speech signal and a target vector, a method of analyzing the input speech signal comprising:"

"generating from the target vector and the short term characteristics, a plurality of sequences of variable-amplitude pulses, each of the sequences having a different average amplitude value" (col. 4, lines 12-51); and

"outputting a signal corresponding to a sequence of equal-amplitude pulses which, according to an error criterion, represents the target vector" (col. 6, lines 38-42).

As per claim 2, Bialik teaches, "wherein the target vector is matched using a perceptual weighting criterion" (col. 6, lines 42-44).

As per claim 3, Bialik teaches, "a speech processing system including a signal processor arrangement that analyzes an input speech signal and, in response, generates the short-term characteristics of the input speech signal and a target vector, comprising:"

"means for generating from the target vector and the short term characteristics, a plurality of sequences of variable-amplitude pulses, each of the sequences having a different average amplitude value" (col. 4, lines 12-52); and

"means for outputting a signal corresponding to a sequence of equal-amplitude pulses which, according to an error criterion, represents the target vector" (col. 6, lines 38-42).

As per claim 4, Bialik teaches, "wherein the target vector is matched using a perceptual weighting criterion" (col. 6, lines 42-44).

As per claim 5, Bialik teaches, "a speech processing system including a signal processor arrangement that analyzes an input speech signal and, in response, generates the short-term characteristics of the input speech signal and a target vector, comprising:"

"an analyzer adapted to receive the target vector and the short term characteristics and to generate a plurality of sequences of variable-amplitude pulses, each of said sequences having a different average amplitude value" (col. 4, lines 12-51);

"the analyzer being further adapted to output a signal corresponding to a sequence of equal-amplitude pulses which, according to an error criterion, represents the target vector" (col. 6, lines 38-42).

As per claim 6, Bialik teaches, "wherein the target vector is matched using a perceptual weighting criterion" (col. 6, lines 42-44).

As per claim 7, Bialik teaches, "a speech processing system including a signal processor arrangement that analyzes an input speech signal and, in response, generates the short-term characteristics of the input speech signal and a target vector, comprising:"

"a multi-pulse analyzer adapted to receive the target vector and the short term characteristics and to generate a plurality of sequences of variable-amplitude, variable-sign and variably-spaced pulses, each of said sequences having a different average amplitude value, each of said pulses within each sequence having variable amplitudes and variable signs" (col. 4, lines 12-51);

"the multi-pulse analyzer being further adapted to output a signal corresponding to a sequence of equal-amplitude, variable-sign, variably-spaced pulses which, according to a maximum likelihood criterion, most closely represents the target vector" (col. 6, lines 38-42).

As per claim 8, Bialik teaches, " wherein the target vector is matched using a perceptual weighting criterion" (col. 6, line 42-44).

As per claim 9, Bialik teaches, "wherein the pulse amplitude variations are based on at least one of the exponential function; a linear function; the short-term characteristics of the input speech signal; the long-term characteristics of the input speech signal; and the excitation signal from previous frames" (col. 3, line 55 to col. 5, line 65).

As per claim 10, Bialik teaches, "a speech processing system comprising:"

"a short-term analyzer that analyzes an input speech signal, and in response to said input speech signal, generates the short-term characteristics of the input speech signal" (col. 3, lines 1-27);

"a target vector generator for generating data including a target vector from at least said input speech signal, and optionally, said short-term characteristics" (col. 3, lines 49-57); and

"a multi-pulse analyzer adapted to receive the target vector and the short term characteristics and to generate a plurality of sequences of variable amplitude, variable sign, variably-spaced pulses, each of said sequences having a different average amplitude value, each of said pulses within each sequence having variable amplitudes

and variable signs, said multi pulse analyzer for outputting a signal corresponding to the

sequence of equal amplitude, variable sign, variably spaced pulses which, according to

a maximum likelihood criterion, most closely represents said target vector" (col. 3, line

58 to col. 4, line 51).

As per claim 11, Bialik teaches, "wherein the target vector is matched using a

perceptual weighting criterion (col. 6, lines 42-44); and

"wherein the pulse amplitude variations are based on at least one of: the

exponential function; a linear function; the short-term characteristics of the input speech

signal; the long-term characteristics of the input speech signal; and the excitation signal

from previous frames" (col. 4, line 55 to col. 5, line 65).

As per claim 12, Bialik teaches, "a speech processing system comprising:"

"a short-term analyzer that analyzes an input speech signal, and in response to

said input speech signal, generates the short-term characteristics of the input speech

signal" (col. 3, lines 6-26);

"a target vector generator for generating a target vector from at least said input

speech signal, and optionally, said short-term characteristics" (col. 3, lines 49-57); and

"a multi-pulse analyzer connected to an output line of said target vector generator and

an output line of said short term analyzer, wherein said multi-pulse analyzer generates a

plurality of sequences of variable amplitude, variable sign, variably spaced pulses, each

of said sequences having a different average amplitude value, each of said pulses

within each sequence having variable amplitudes and variable signs, said multi-pulse

analyzer for outputting a signal corresponding to the sequence of variable amplitude,

variable sign, variably spaced pulses which, according to the maximum likelihood

criterion, most closely represents said target vector" (col. 3, lines 48 to col. 4, lines 51).

As per claim 13, Bialik teaches, "wherein the target vector is matched using a

perceptual weighting criterion" (col. 6, lines 42-44).

As per claim 14, Bialik teaches, "wherein the pulse amplitude variations are

based on at least one of: the exponential function; a linear function; the short-term

characteristics of the input speech signal; the long-term characteristics of the input

speech signal; and the excitation signal from previous frames" (col. 4, line 55 to col. 5,

line 54).

As per claim 15, Bialik teaches, "a speech processing system comprising:"

"a short-term analyzer that analyzes an input speech signal, and in response to

said input speech signal, generates the short-term characteristics of the input speech

signal" (col. 3, lines 6-12);

"a target vector generator for generating a target vector from at least said input

speech signal, and optionally, said short-term characteristics" (col. 3, lines 14-26); and

"a multi-pulse analyzer connected to an output line of said target vector generator

and an output line of said short term analyzer, wherein said multi-pulse analyzer

generates a plurality of sequences of variable amplitude, variable sign, variably spaced

pulses, each of said sequences having a different average amplitude value, each of

said pulses within each sequence having variable amplitudes and variable signs, said

multi-pulse analyzer for outputting a signal corresponding to the sequence of variable

amplitude, variable sign, variably spaced pulses which, according to the maximum

likelihood criterion, most closely represents said target vector, and one or more pulse

sequence modifiers, each having as input at least a sequence of equal amplitude,

variable sign, variably spaced pulses, wherein each said pulse sequence modifier

modifies its input sequence and produces as output a sequence of variable amplitude,

variable sign, variably spaced pulses" (col. 3, line 58 to col. 4, line 51).

As per claim 16, Bialik teaches, "wherein the pulse sequence modification

function is based on at least one of: the exponential function; a linear function; the

short-term characteristics of the input speech signal; the long-term characteristics of the

input speech signal; and the excitation signal from previous frames" (col. 4, line 55 to

col. 5, line 54).

As per claim 17, Bialik teaches, "a speech processing system comprising:"

"a short-term analyzer that analyzes an input speech signal, and in response to

said input speech signal, generates the short-term characteristics of the input speech

signal" (col. 3, lines 6-13);

"a long-term analyzer that analyzes an input speech signal, and in response to

said input speech signal, generates the long-term characteristics of the input speech

signal" (col. 3, lines 27-35);

"a target vector generator for generating a target vector from at least said input

speech signal, and optionally, said short-term characteristics, and optionally, said

long-term characteristics" (col. 3, lines 49-57); and

"a pulse-train sequence analyzer connected to at least an output line of said

target vector generator and an output line of said short term analyzer, wherein said

pulse-train sequence analyzer generates a plurality of sequences of variable amplitude, variable sign, variably spaced pulse trains, each of said sequences having a different average amplitude value, each of said pulse trains within each sequence having variable amplitudes and variable signs, said pulse-train sequence analyzer for outputting a signal corresponding to the sequence of equal amplitude, variable sign, variably spaced pulse trains which, according to the maximum likelihood criterion, most closely represents said target vector" (col. 3, line 58 to col. 4, line 51).

As per claim 18, Bialik teaches, "wherein the pulse amplitude variations are based on at least one of: the exponential function; a linear function; the short-term characteristics of the input speech signal; the long-term characteristics of the input speech signal; and the excitation signal from previous frames" (col. 4, line 55 to col. 5, line 65).

As per claim 19, Bialik teaches, "wherein the target vector is matched using a perceptual weighting criterion" (col.6, lines 42-44).

As per claim 20, Bialik teaches, "a speech processing system comprising:"

"a short-term analyzer that analyzes an input speech signal, and in response to said input speech signal, generates the short-term characteristics of the input speech signal" (col. 3, lines 6-13);

"a long-term analyzer that analyzes an input speech signal, and in response to said input speech signal, generates the long-term characteristics of the input speech signal" (col. 3, lines 27-35);

"a target vector generator for generating a target vector from at least said input speech signal, and optionally, said short-term characteristics, and optionally, said long-term characteristics" (col. 3, lines 49-57); and

"a pulse-train sequence analyzer connected to at least an output line of said target vector generator and an output line of said short term analyzer, wherein said pulse-train sequence analyzer generates a plurality of sequences of variable amplitude, variable sign, variably spaced pulse trains, each of said sequences having a different average amplitude value, each of said pulse trains within each sequence having variable amplitudes and variable signs, said pulse-train sequence analyzer for outputting a signal corresponding to the sequence of variable amplitude, variable sign, variably spaced pulse trains which, according to the maximum likelihood criterion, most closely represents said target vector" (col. 3, line 58 to col. 4, line 51).

As per claim 21, Bialik teaches, "wherein the target vector is matched using a perceptual weighting criterion" (col. 6, lines 42-44).

As per claim 22, Bialik teaches, "wherein the pulse amplitude variations are based on at least one of: the exponential function; a linear function; the short-term characteristics of the input speech signal; the long-term characteristics of the input speech signal; and the excitation signal from previous frames" (col. 4, line 55 to col. 5, line 65).

As per claim 23, Bialik teaches, "wherein the pulse amplitude variations are based on at least one of: the exponential function; a linear function; the short-term characteristics of the input speech signal; the long-term characteristics of the input

speech signal; and the excitation signal from previous frames" (col. 4, line 55 to col. 5,

line 65).

As per claim 24, Bialik teaches, "wherein the pulse amplitude variations are

based on at least one of: the exponential function; a linear function; and characteristics

of the input speech signal" (col. 4, line 55 to col. 5, line 65).

As per claim 25, Bialik teaches, "a speech processing system comprising:"

"a short-term analyzer that analyzes an input speech signal, and in response to

said input speech signal, generates the short-term characteristics of the input speech

signal" (col. 3, lines 6-13);

"a long-term analyzer that analyzes an input speech signal, and in response to

said input speech signal, generates the long-term characteristics of the input speech

signal" (col. 3, lines 27-35);

"a target vector generator for generating a target vector from at least said input

speech signal, and optionally, said short-term characteristics, and optionally, said

long-term characteristics" (col. 3, lines 49-57); and

"a pulse-train sequence analyzer connected to at least an output line of said

target vector generator and an output line of said short term analyzer, wherein said

pulse-train sequence analyzer generates a plurality of sequences of variable amplitude,

variable sign, variably spaced pulse trains, each of said sequences having a different

average amplitude value, each of said pulse trains within each sequence having

variable amplitudes and variable signs, said pulse-train sequence analyzer for

outputting a signal corresponding to the sequence of variable amplitude, variable sign,

variably spaced pulse trains which, according to the maximum likelihood criterion, most closely represents said target vector" (col. 3, line 58 to col. 4, line 51), and

"one or more pulse-train sequence modifiers, each having as input at least a sequence of equal amplitude, variable sign, variably spaced pulse trains, wherein each said pulse sequence modifier modifies its input sequence and produces as output a sequence of variable amplitude, variable sign, variably spaced pulse trains" (col. 3, line 58 to col. 4, line 51).

As per claim 26, Bialik teaches, "wherein the target vector is matched using a perceptual weighting criterion" (col. 6, lines 42-44).

As per claim 27, Bialik teaches, "wherein the pulse amplitude variations are based on at least one of: the exponential function; a linear function; the short-term characteristics of the input speech signal; the long-term characteristics of the input speech signal; and the excitation signal from previous frames" (Fig. 2).

As per claim 29, Bialik teaches, "wherein the pulse-train sequence modification function is based on a linear function" (col. 4, line 55 to col. 5, line 65).

As per claim 30, Bialik teaches, "wherein the pulse-train sequence modification function is based on the short-term characteristics of the input speech signal" (col. 4, lines 55-65).

As per claim 31, Bialik teaches, "wherein the pulse-train sequence modification is based on the long-term characteristics of the input speech signal" (col. 5, lines 1-15).

As per claim 32, Bialik teaches, "wherein the pulse-train sequence modification function is based on the excitation signal from previous frames" (col. 5, lines 16-40).

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

6.   Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bialik et

al. (US 5,568,588).

As per claim 28, Bialik does not explicitly teach modifying the pulse train based

on the exponential function. Official Notice is taken on the well-known in the art of

speech processes to use pulse trains constructed based on the exponential function. It

would have been obvious to one of ordinary skill in the art at the time of the invention to
                                                                    the
modify the exponential function because output speech quality is greatly increased, and
                                                            ^
perceptually smooth.

Conclusion

7.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to **Abul K. Azad** whose telephone number is **(703) 305-**

3838.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, **Marsha D. Banks-Harold**, can be reached at **(703) 305-4379.**

Any response to this action should be mailed to:

Commissioner for Patents

Washington, D.C. 20231

Or faxed to:

(703) 872-9314

(For informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal

Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application should

be directed to the Group Receptionist whose telephone number is **(703) 305-4700.**

Abul K. Azad

January 28, 2002